Pharmaceutical Treatment of Terrestrial Acanthocephalans (*Prosthenorchis elegans*) in Squirrel Monkeys

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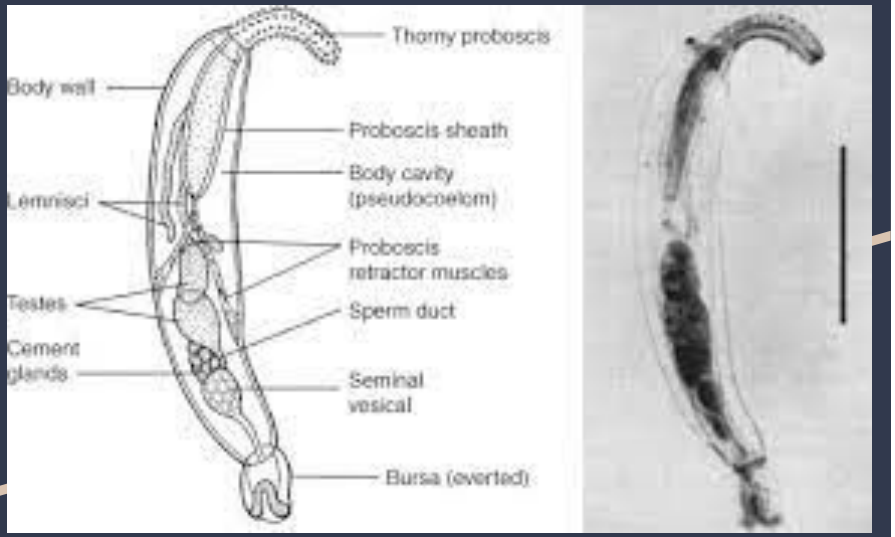
Background: Phylum Acanthocephala



Acanthocephalan Features:

-Pseudocoelomate classification

-Endoparasitic with indirect life cycle including two sets of hosts

-Intermediate hosts: Crustaceans, Beetles (cockroaches, earwigs)

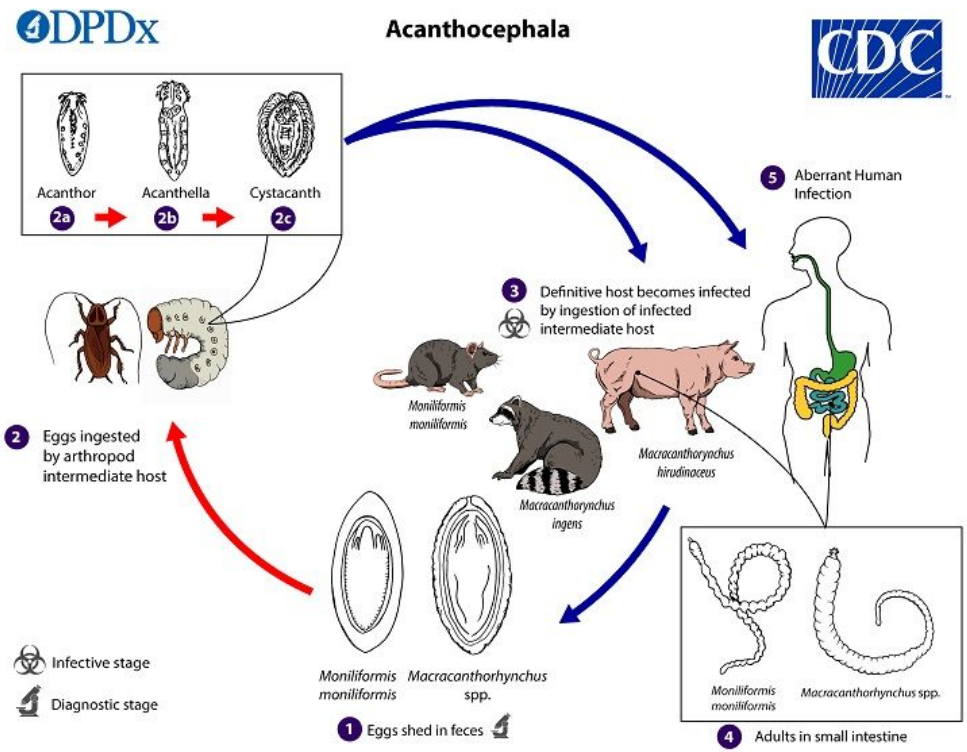
-Definitive Hosts: Various mammalian life

-Evertable, hooked proboscis

-Attach directly to the inner linings of intestinal tract

-Dioecious

Acanthocephala Life Cycle

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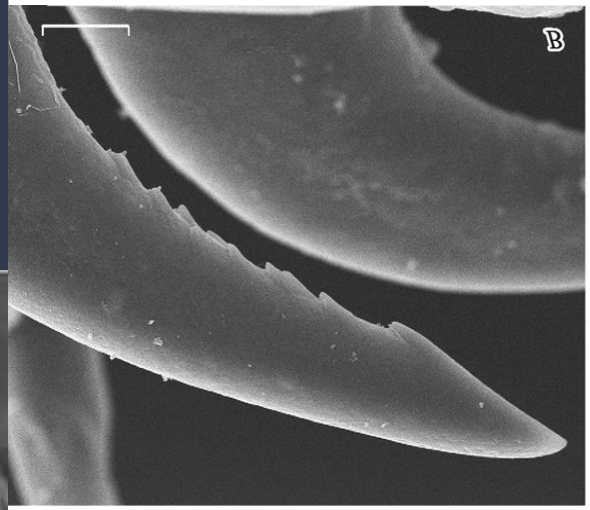
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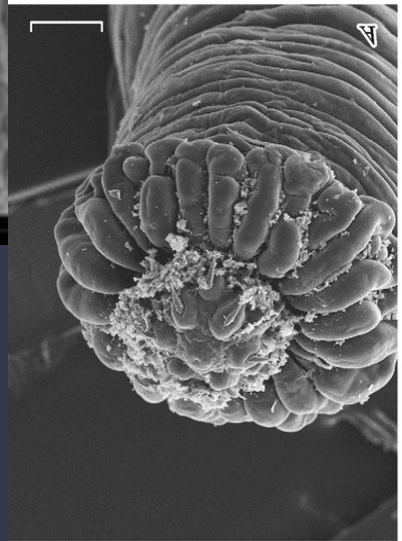
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Abstract:

- Study group consists of squirrel monkeys held in captivity in Mexico

-Squirrel monkeys are primarily insectivorous

-Issues first arose with squirrel monkeys dying in greater numbers within breeding facilities

Purpose:

-To identify the immediate host that transmits cystacanths to the monkeys

-Determine a method to treat acanthocephalan infestation within already infected monkeys

-finding whether or not direct surgery is necessary for eradication

Clinical Importance:

Importation of captive squirrel monkeys from South America to North American countries such as Mexico has found an infestation increase within captive colonies, due to a cyclical form of breeding monkeys in captivity.

Within the specific breeding facility, higher infestation resulted from:

- Prevalence of food waste
- Insectivorous eating habits of squirrel monkeys

Infestation of *P. elegans* did not spread to other captive species (capuchin monkeys) due to different eating habits.

Clinical Importance *(cont.)*:

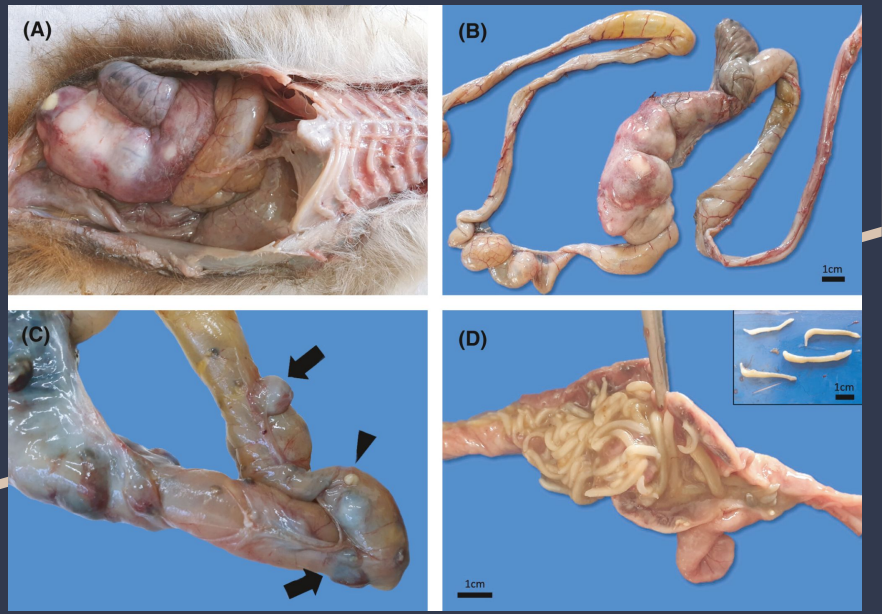
P. elegans infections typically had more severe effects on juvenile squirrel monkeys

Adult squirrel monkeys were mainly asymptomatic except in cases of mass bacterial infection

Half of the adults within the studied group of 20 died, all of which from peritonitis.

large amounts of adult worms were found within the dead population

Clinical Importance *(cont.)*:



P. elegans infestations harmed the livelihood entire colony of squirrel monkeys kept in captivity:

- Anorexia
- Emaciation
- Cachexia
- Edema
- Chronic Diarrhea
- Peritonitis

Peritonitis found in autopsies of dead squirrel monkeys caused necrotic debris and was the site of infection.

Data prior to Treatment (Autopsies):

Symptoms:	**Monkeys Affected:**
Adult *P. elegans* in intestinal cavity	9
Adult *P. elegans* in liver	3
Emaciation	10
Edema within the neck	6
Peritonitis	10

Pharmaceutical Treatment:

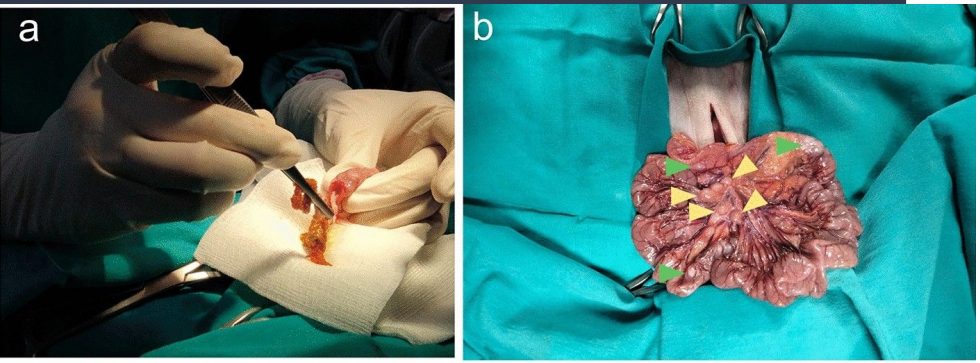
-Known treatments used on other acanthocephalans proved to have low efficacy

-Eggs still being seen in fecal examinations and the survival of adult worms.

_ombination of drugs used to treat the parasite in marine environments was administered.

- Niclosamide typically used to treat cestodes (Tapeworms)
- Loperamide helps to treat diarrhea

Results



After treatment, there were noticeable differences in both the fecal examination and examination of the liver:

- Complete eradication of *P. elegans* eggs within feces
- Noticeably lower amount of juvenile worms
- Remaining juvenile worms dead or dying

Adult worms still managed to stay alive and attached, requiring manual extraction

Conclusion

Squirrel monkeys within captivity are more susceptible to severe infections

Typical anti-helminth drugs do not work to kill *P. elegans* within any stage of the lifestyle

-Use of niclosamide and loperamide are able to expedite the extraction process.

-Surgery still required to completely eradicate

Article Cited:

José Zárate-Ramos, J. J., et al. “An alternative treatment against Acanthocephala (*prosthenorchis elegans*) in captive squirrel monkeys (*saimiri sciureus*) in Mexico.” *Journal of Parasitology*, vol. 104, no. 5, 2018, pp. 574–575, https://doi.org/10.1645/17-93.